Name:

at1121exam_practice: Radicals and Squares (v602)

Question 1

Simplify the radical expressions.

$\sqrt{63}$ $\qquad$ $\sqrt{44}$ $\qquad$ $\sqrt{12}$

$\sqrt{3 \cdot 3 \cdot 7}$ $\qquad$ $\sqrt{2 \cdot 2 \cdot 11}$ $\qquad$ $\sqrt{2 \cdot 2 \cdot 3}$

$3\sqrt{7}$ $\qquad$ $2\sqrt{11}$ $\qquad$ $2\sqrt{3}$

Question 2

Find all solutions to the equation below:

$$\frac{(x-9)^2}{10} - 2 = 8$$

First, add 2 to both sides.

$$\frac{(x-9)^2}{10} = 10$$

Then, multiply both sides by 10.

$$(x-9)^2 = 100$$

Undo the squaring. Remember the plus-minus symbol.

$$x - 9 = \pm 10$$

Add 9 to both sides.

$$x = 9 \pm 10$$

So the two solutions are $x = 19$ and $x = -1$.

Question 3

By completing the square, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 + 8x = 33$$

$$x^2 + 8x + 16 = 33 + 16$$
$$x^2 + 8x + 16 = 49$$
$$(x+4)^2 = 49$$
$$x + 4 = \pm 7$$
$$x = -4 \pm 7$$
$$x = 3 \quad \text{or} \quad x = -11$$

Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 2x^2 + 24x + 68$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 2 .

$$y = 2(x^2 + 12x) + 68$$

We want a perfect square. Halve 12 and square the result to get 36 . Add and subtract that value inside the parentheses.

$$y = 2(x^2 + 12x + 36 - 36) + 68$$

Factor the perfect-square trinomial.

$$y = 2((x+6)^2 - 36) + 68$$

Distribute the 2.

$$y = 2(x+6)^2 - 72 + 68$$

Combine the constants to get **vertex form**:

$$y = 2(x+6)^2 - 4$$

The vertex is at point $(-6, -4)$.